

# PATENT SPECIFICATION

981,129

DRAWINGS ATTACHED.

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## COMPLETE SPECIFICATION.

### Improvements relating to Crane Booms.

We, JOHN ALLEN & SONS (OXFORD) LIMITED, a British Company, of Cowley, Oxford, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns improvements relating to crane booms adapted for transportation, and particularly though not exclusively to derricking jib cranes mounted on road vehicles.

Known such cranes comprise a basic length of boom, for example 25 or 30 ft. in length, such basic length being divided into two equal lengths one of which will be called the jib hinge portion and the other of which the jib head portion, the two portions being pin jointed or butt jointed together. Extension lengths, for example of 5, 15 or 20 ft., may be included between said jib hinge and head portions to give a boom of a desired final length.

It has been usual for vehicles to travel with the full boom length in position and resting over a carrier part of the vehicle designed to support the head end of the boom. This is an unwieldy arrangement and regulations may apply governing overhang of equipment on vehicles. If, to avoid such difficulties, an existing boom were to be folded at the normal joint of the hinge and head portions it may fall short of the existing boom rest, and moreover the head portion may foul the turntable carrying the boom by its hinge portion.

According to the invention there is provided in or for a crane boom an extension boom length adapted to be included between a main hinge portion and a main

head portion of the boom and comprising subsidiary hinge and head portions, hinge means whereby said subsidiary portions are connected together at adjacent ends, and means to lock said subsidiary portions together end to end.

Advantageously the subsidiary hinge portion is longer than the subsidiary head portion, where the basic main portions are of equal length as indicated above. Thus, when incorporated in a vehicle-mounted jib crane boom, the subsidiary jib hinge portion brings the hinge joint of the total jib hinge and head lengths beyond the boom rest. Also, the total jib head length being now shorter than the total jib hinge length is allowed to fold thereunder without difficulty.

An embodiment of the invention is hereinafter described by way of example with reference to the accompanying drawings in which:—

Figs. 1 to 4 indicate the sequence of folding the boom of a derricking jib crane mounted on a road vehicle and comprising an extension boom length in accordance with the invention;

Fig. 5 is a side view on a larger scale of the extension boom length;

Fig. 6 is an underneath view of such boom length; and

Fig. 7 is an end view of such boom length as seen in direction VII in Fig. 5.

As shown in the drawings, the boom 1 of a derricking jib crane 2 mounted on a road vehicle 3 comprises a main jib hinge portion 4, hingedly connected to a turntable 5 on the vehicle, and a main jib head portion 6. Each portion is of conventional built-up form including longitudinal girders 7 set one at each corner of a rect-

[Price 4s. 6d.]

angular cross-section with bracing members 8 extending criss-cross between each adjacent pair of girders. The outer end of the hinge portion 4 carries vertical lugs 9 one at each corner of the boom cross-section, adapted to be received in corresponding clevis formations 10 carried by the inner end of the head portion 6, the co-operating lugs and clevis formations being bored transversely to receive clevis pins, lying substantially in the effective upper and lower inertia planes, to lock the boom portions 4 and 6 together when the extension boom length is not incorporated. These boom portions are for example each 15 ft. in length.

The extension boom length 11 comprises a subsidiary jib hinge portion 12, for example 3 ft. long, and a shorter subsidiary jib head portion 13, for example 2 ft. long. Each such portion is of a welded built-up form, corresponding to the main boom portions 4 and 6, comprising a longitudinal angle-section girder 14 at each corner of a rectangular cross-section and criss-cross bracing members 15 and end bracing members 15<sup>1</sup> extending between each adjacent pair of girders. Each corner of the cross-sections at the ends of the portions has a strengthening corner cap 16 bearing a bored connecting lug 17, 18, 18<sup>1</sup> or clevis formation 19, 20, 20<sup>1</sup>. Additional bracing strips 29 are welded at the ends of the portions across each corner.

Thus, one end of the subsidiary jib hinge portion 12 bears clevis formations 19 to co-operate with the lugs 9 of the main jib hinge portion 4, these two portions being adapted to be locked end to end by clevis pins, such as indicated at P (Fig. 6) and of any suitable form. Similarly, one end of the subsidiary jib head portion 13 bears lugs 17 to co-operate with the clevis formations 10 carried by the inner end of the main jib head portion 6, these two portions also being adapted to be locked together end to end by clevis pins.

The other two adjacent ends of the subsidiary jib portions 12, 13 are similarly provided one end with lugs 18, 18<sup>1</sup> and the other end with co-operating clevis formations 20, 20<sup>1</sup>. However, at this joint the co-operating lugs 18<sup>1</sup> and clevis formations 20<sup>1</sup> to the underside of the boom are bored to receive clevis pins providing a transverse hinge axis H sufficiently far below the general lower plane of the boom portions when set end to end to allow the subsidiary jib head portion 13 to be folded back to lie beneath and substantially parallel with the subsidiary jib hinge portion 12. That is the total jib head length can be similarly folded back beneath the total jib hinge length about such hinge axis H. The same two pairs of co-

operating lugs 18<sup>1</sup> and clevis formations 20<sup>1</sup> presenting said hinge axis commonly present parallel transverse bores L to receive locking clevis pins substantially in the inertia plane of the lowermost pair of girders 14. The co-operating lugs 18 and clevis formations 20 to the upper side of the boom at this joint also receive locking clevis pins substantially in the inertia plane of the uppermost pair of girders 14.

For travelling order of the vehicle with the hinged extension boom length 11 incorporated between the main jib hinge and jib head portions 4 and 6, the total jib head length is folded back beneath the total jib hinge length about the hinge axis H as aforesaid, in the sequence illustrated in Figs. 1 to 4. Thus, with the boom lowered to the ground position as in Fig. 2 the hoist rope 21 is disconnected, the derricking cable system 22 is connected to clevis means 23 carried at the uppermost side of the outer end of the main jib hinge portion 4, the hinge clevis pins ensured to be in position, and the locking clevis pins interconnecting the subsidiary jib hinge and head portions 12, 13 are removed. For this operation, the same clevis pins may be used alternately as the lower locking pins or the hinge pins, such pins being repositioned from their locking to their hinge position. Alternatively, separate hinge pins could be left in place throughout the folding and erection operations.

Then as seen in Fig. 3 the hinged boom is derricked in and the hoist rope 21 reeved to a rope socket at the boom head 24, whence the folding operation is completed by drawing in the boom head, rotating the crane on its turntable and lowering the folded boom on to the rest 25 on the vehicle with the boom head well clear of the turntable, as seen in Fig. 4.

The sequence is reversed to erect the boom, except that to assist in straightening the boom from the position of Fig. 3, the derricking cable system 22 may be connected to clevis formations 26 carried by the subsidiary jib head portion 13 at its uppermost side in erected condition.

Thus the total jib head length is swung about its hinge axis into working position, in which it is locked to the total jib hinge length by the locking clevis pins at the hinge joint.

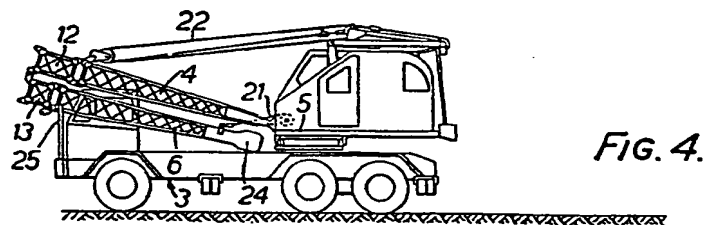
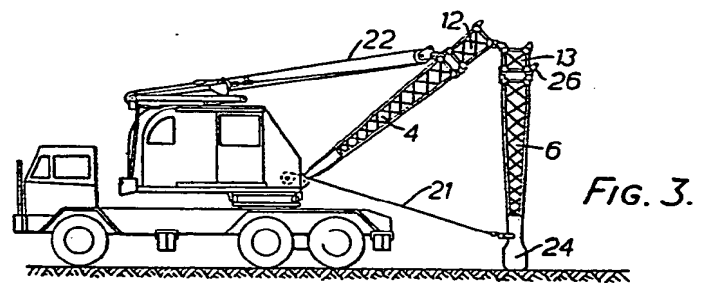
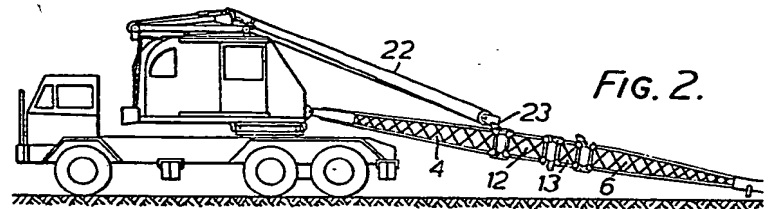
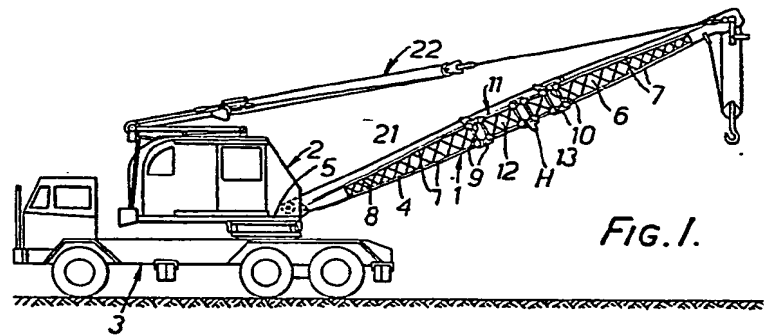
Conventional extension lengths as mentioned hereinabove may be additionally included in the erected boom if desired.

The vehicle may have outrigger means for screw or like ground jacks to extend the vehicle base during crane operation in known manner.

WHAT WE CLAIM IS:—

1. In or for a crane boom, an extension- 130

- sion boom length adapted to be included between a main hinge portion and a main head portion of the boom and comprising a subsidiary hinge portion and a subsidiary head portion, hinge means whereby said subsidiary portions are pivotally connected together at adjacent ends, and means to lock said pivoted subsidiary portions together end to end when required.
2. An extension boom length according to Claim 1 wherein the subsidiary hinge portion is longer than the subsidiary head portion.
3. An extension boom length according to Claim 1 or 2 wherein the locking means comprises on said subsidiary portions a plurality of bored clevis formations and lugs co-operating therewith to receive clevis pins.
4. An extension boom length according to Claim 1, 2 or 3 wherein the hinge means comprises on said subsidiary portions bored clevis formations and lugs co-operating to receive clevis pins.
5. An extension boom length according to Claims 3 and 4 wherein a pair of the co-operating clevis formations and a pair of lugs on said subsidiary portions serve as both the hinge and the locking means.
6. An extension boom length according to Claim 5 wherein a pair of clevis formations and a pair of lugs are each bored at two positions to receive clevis pins, at one locking bore position as part of the locking means and at another hinge bore position to provide a hinge axis transverse of the boom length.
7. An extension boom length according to Claim 6 wherein said hinge axis is located below the general lower plane of the boom portions when set end to end to allow the subsidiary jib head portion to be folded back to lie beneath and substantially parallel with the subsidiary jib hinge portion, whereby in the assembled crane boom comprising the main and subsidiary head and hinge portions the total head length can be similarly folded back beneath the total hinge length about said hinge axis.
8. An extension boom length according to Claim 3 or any of Claims 4 to 7 as appendant thereto, wherein said subsidiary portions are each of a built-up form to correspond to the main boom portions and comprising a longitudinal girder at each corner of a rectangular cross-section, and the locking clevis pins are located substantially in the respective inertia planes of the uppermost and lowermost pairs of such girders.
9. An extension boom length according to any of Claims 1 to 8 wherein the subsidiary head portion carries, at its uppermost side in erected condition, means to receive a derricking cable end to assist in erection of the assembled crane boom comprising the main and subsidiary head and hinge portions.
10. A crane boom adapted for transportation and comprising an extension boom length according to any of Claims 1 to 9.
11. In or for a crane boom adapted for transportation, an extension boom length substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.
12. In or for a crane boom an extension boom length substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.
- For the Applicants:—  
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 London, W.C.1.



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COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale  
Sheets 1 & 2

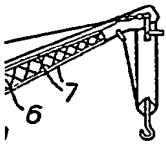


FIG. 1.

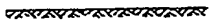


FIG. 2.

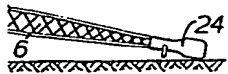


FIG. 3.



G. 4.

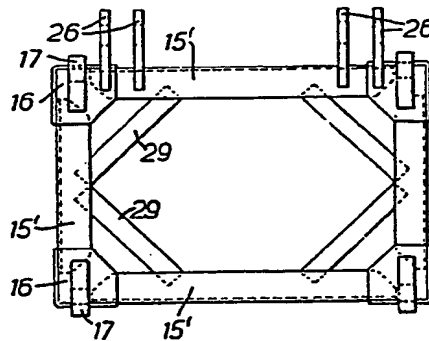
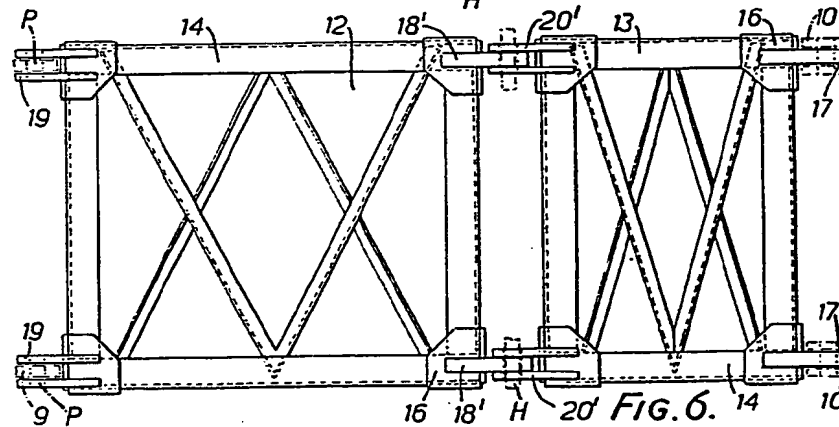
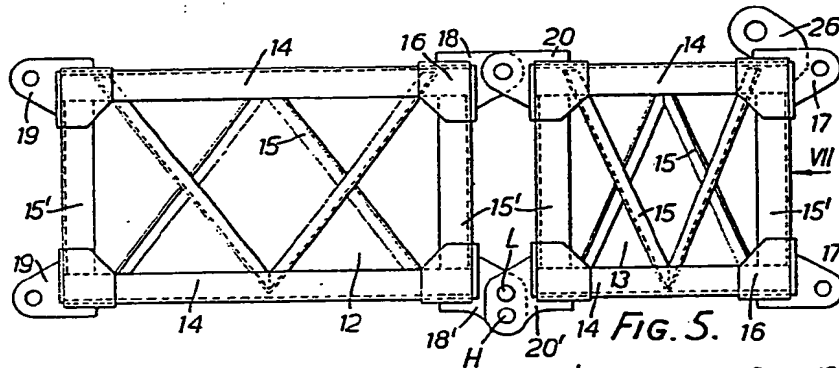


FIG. 7.

